

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. – 13. (Cancelled)

14. (New) An optical engine comprising:

a housing;

a lens configured to allow a light ray emitted from a light source to enter an inside of the housing;

a plurality of light separation elements configured to separate the light ray entered via the lens into a plurality of primary color light rays;

a plurality of reflection type liquid crystal elements that are arranged to correspond to the plurality of primary color light rays separated by the light separation elements, and are configured to emit reflected light rays modulated from the primary color light rays based on an image signal;

a plurality of reflection polarizing plates that are arranged to correspond to the plurality of reflection type liquid crystal elements, and are configured to reflect the primary color light rays separated by the light separation elements, thereby allowing them to enter the reflection type liquid crystal elements and configured to allow the reflected light rays emitted from the reflection type liquid crystal elements to pass therethrough;

a combining prism configured to combine the light rays that passed the plurality of reflection polarizing plates;

a projection lens configured to emit the light rays combined by the combining prism outside; and

a radiator provided on a rear surface of each of the plurality of reflection type liquid crystal elements whereby each radiator is exposed to an outside of the housing,

wherein the housing is configured to define a space sealed up from the outside by arranging an incident surface of the lens, an outgoing surface of the projection lens and the rear surfaces of the plurality of reflection type liquid crystal elements so as to be exposed to the outside, and

wherein the plurality of light separation elements, the plurality of reflection polarizing plates and the combining prism are positioned inside the housing.

15. (New) The optical engine according to claim 14, further comprising a cooling fan, wherein the cooling fan is located outside of the housing.

16. (New) The optical engine according to claim 14, further comprising:
a phase difference plate and a polarizing plate which control polarizing characteristics of the reflection type liquid crystal elements are arranged in light paths on which the primary color light rays separated by the light separation elements pass to the reflection type liquid crystal elements, wherein the phase difference plate and the polarizing plate are located inside the housing.

17. (New) The optical engine according to claim 14, wherein the lens, the plurality of light separation elements, the plurality of reflection polarizing plates, the combining prism and the projection lens are formed from inorganic materials.

18. (New) A projection type display apparatus comprising:
a light source; and
an optical engine comprising:
a housing;
a lens configured to allow a light ray emitted from a light source to enter an inside of the housing;
a plurality of light separation elements configured to separate the light ray entered via the lens into a plurality of primary color light rays;
a plurality of reflection type liquid crystal elements that are arranged to correspond to the plurality of primary color light rays separated by the light separation elements, and are configured to emit reflected light rays modulated from the primary color light rays based on an image signal;
a plurality of reflection polarizing plates that are arranged to correspond to the plurality of reflection type liquid crystal elements, and are configured to reflect the primary color light rays separated by the light separation elements, thereby allowing them to enter the

reflection type liquid crystal elements and configured to allow the reflected light rays emitted from the reflection type liquid crystal elements to pass therethrough;

a combining prism configured to combine the light rays that passed the plurality of reflection polarizing plates;

a projection lens configured to emit the light rays combined by the combining prism outside; and

a radiator provided on a rear surface of each of the plurality of reflection type liquid crystal elements whereby each radiator is exposed to an outside of the housing,

wherein the housing is configured to define a space sealed up from the outside by arranging an incident surface of the lens, an outgoing surface of the projection lens and the rear surfaces of the plurality of reflection type liquid crystal elements so as to be exposed to the outside, and

wherein the plurality of light separation elements, the plurality of reflection polarizing plates and the combining prism are positioned inside the housing.

19. (New) The projection type display apparatus according to claim 18, further comprising a cooling fan, wherein the cooling fan is located outside of the housing of the optical engine.

20. (New) The projection type display apparatus according to claim 18, wherein the optical engine further comprising:

a phase difference plate and a polarizing plate which control polarizing characteristics of the reflection type liquid crystal elements are arranged in light paths on which the primary color light rays separated by the light separation elements pass to the reflection type liquid crystal elements, wherein the phase difference plate and the polarizing plate are located inside the housing.

21. (New) The projection type display apparatus according to claim 18, wherein the lens, the plurality of light separation elements, the plurality of reflection polarizing plates, the combining prism and the projection lens are formed from inorganic materials.